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Bramble et al.

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(54) **SUMP PUMP APPARATUS AND METHOD**

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(51) **Int. Cl.**

F04B 49/025	(2006.01)
E03F 5/10	(2006.01)
E03F 1/00	(2006.01)
E03F 5/22	(2006.01)

(52) **U.S. Cl.**
CPC ***E03F 5/107*** (2013.01); ***E03F 1/00*** (2013.01); ***E03F 5/22*** (2013.01); ***F04B 49/025*** (2013.01); *Y10T 137/6988* (2015.04)

(58) **Field of Classification Search**
CPC E03F 5/22; E04B 1/7023; F04B 49/025; Y10T 137/6988; F04D 13/08; F04D 29/605
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,057,366 A *	11/1977	Niemann	....	F04D 29/605 417/234
4,422,829 A *	12/1983	Buchanan	....	F04F 5/48 417/181
4,456,432 A *	6/1984	Mannino	....	F04D 13/068 417/2
6,308,924 B1 *	10/2001	Janesky	....	F04D 29/606 248/346.01
8,474,477 B1 *	7/2013	Melisz, Jr.	....	E02D 29/12 137/363
8,875,729 B1 *	11/2014	Bramble	....	F04D 13/068 137/362
2005/0281679 A1 *	12/2005	Niedermeyer	....	F04D 15/029 417/36
2006/0093492 A1 *	5/2006	Janesky	....	F04D 29/426 417/366
2007/0047382 A1 *	3/2007	McCurdy	....	B01F 1/0011 366/153.1
2009/0183785 A1 *	7/2009	Cole	....	E03F 5/22 137/363

* cited by examiner

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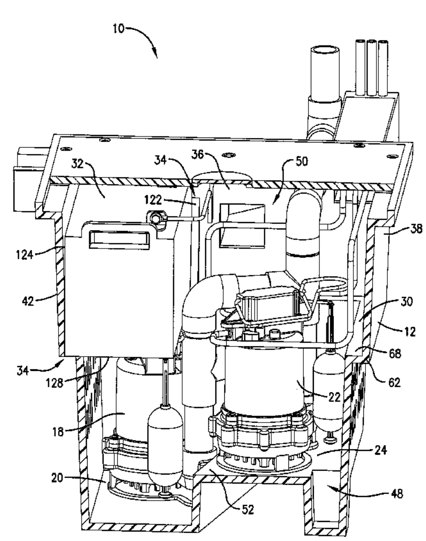
(57) **ABSTRACT**

A sump pump assembly with a basin, a first shelf fixedly position in a lower end of the basin, a lid for securing to an upper end of the basin, the lid having a transparent window for viewing a water level in the basin, a light mounted within the basin for assisting in viewing the water level, a first pump positioned on a floor of the basin, a second pump positioned on the first shelf, and an alarm for notifying a building owner when the first pump ceases to operate but prior to operation of the second pump. Alternative embodiments comprise a battery-powered third pump, a battery for powering the third pump, and a mount for mounting the battery inside the basin.

19 Claims, 8 Drawing Sheets



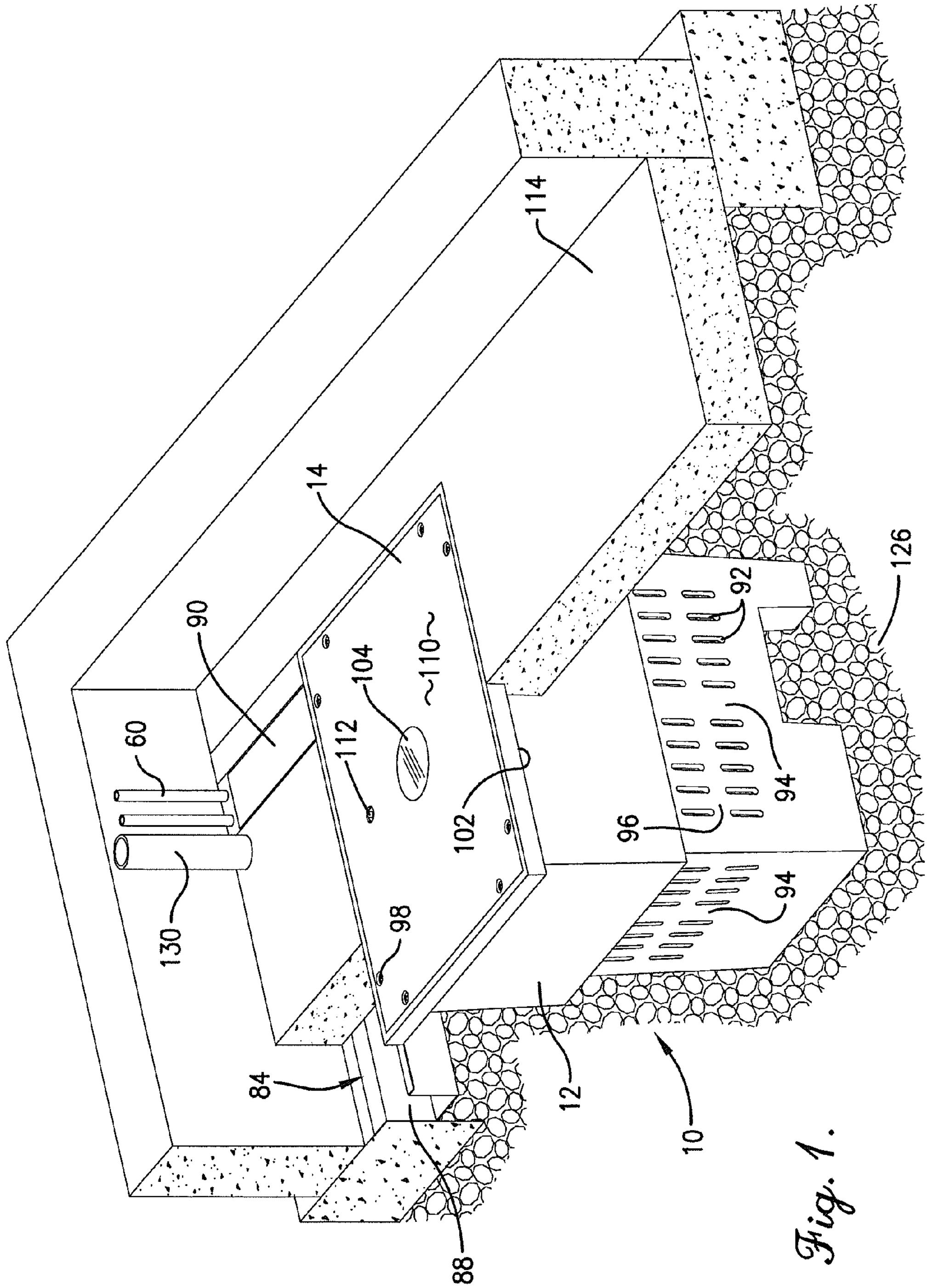


Fig. 1.

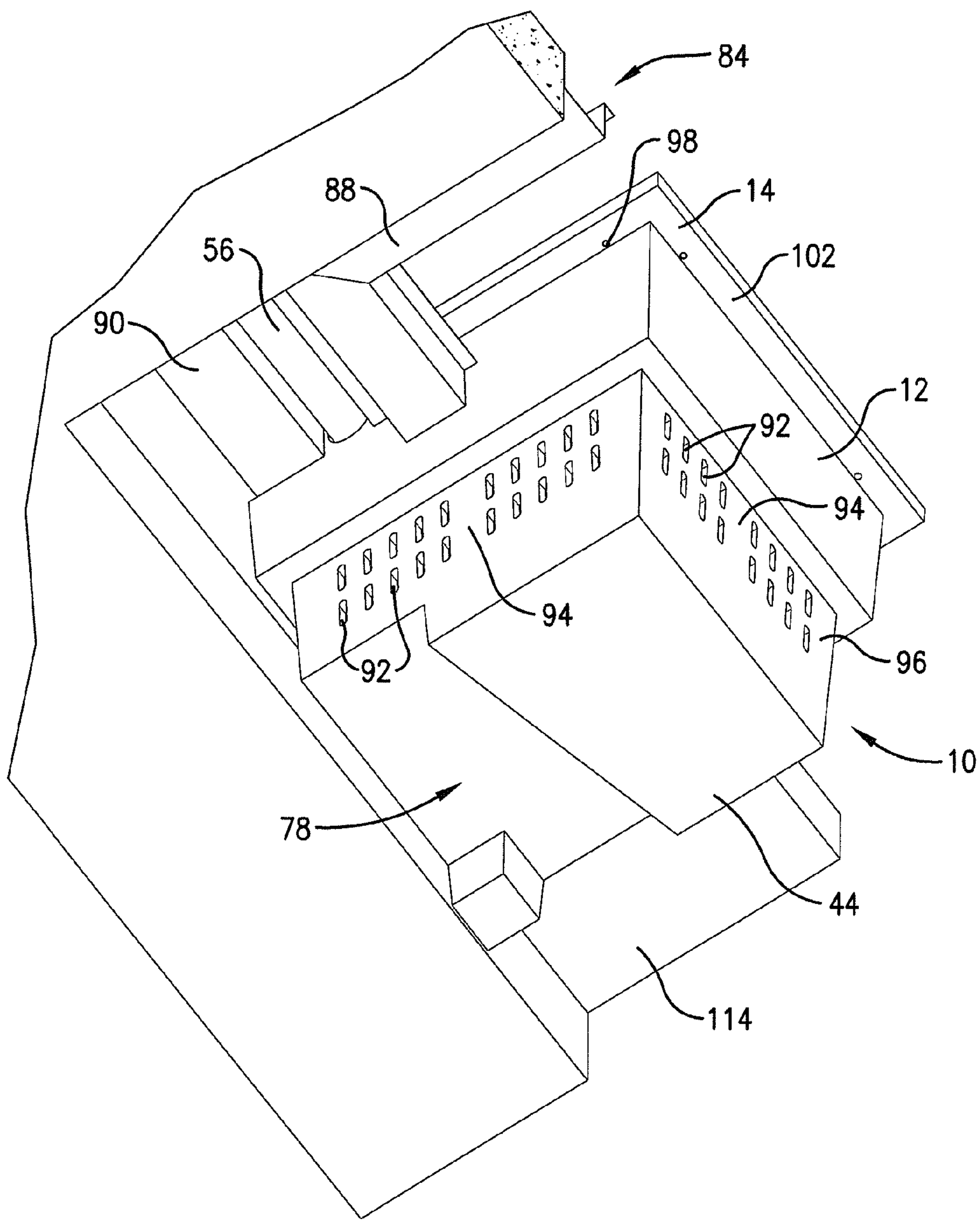


Fig. 2.

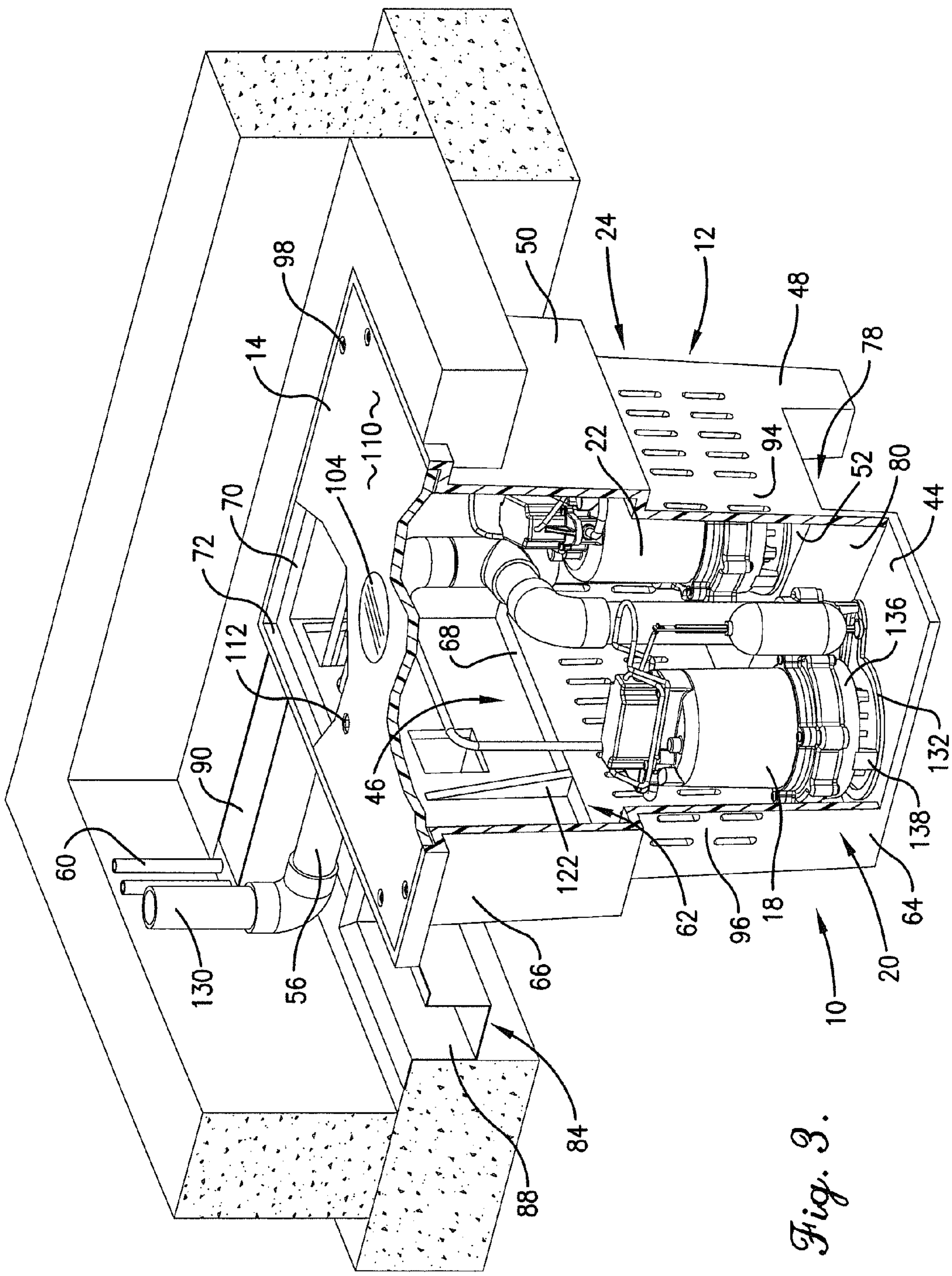

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Fig. 3.

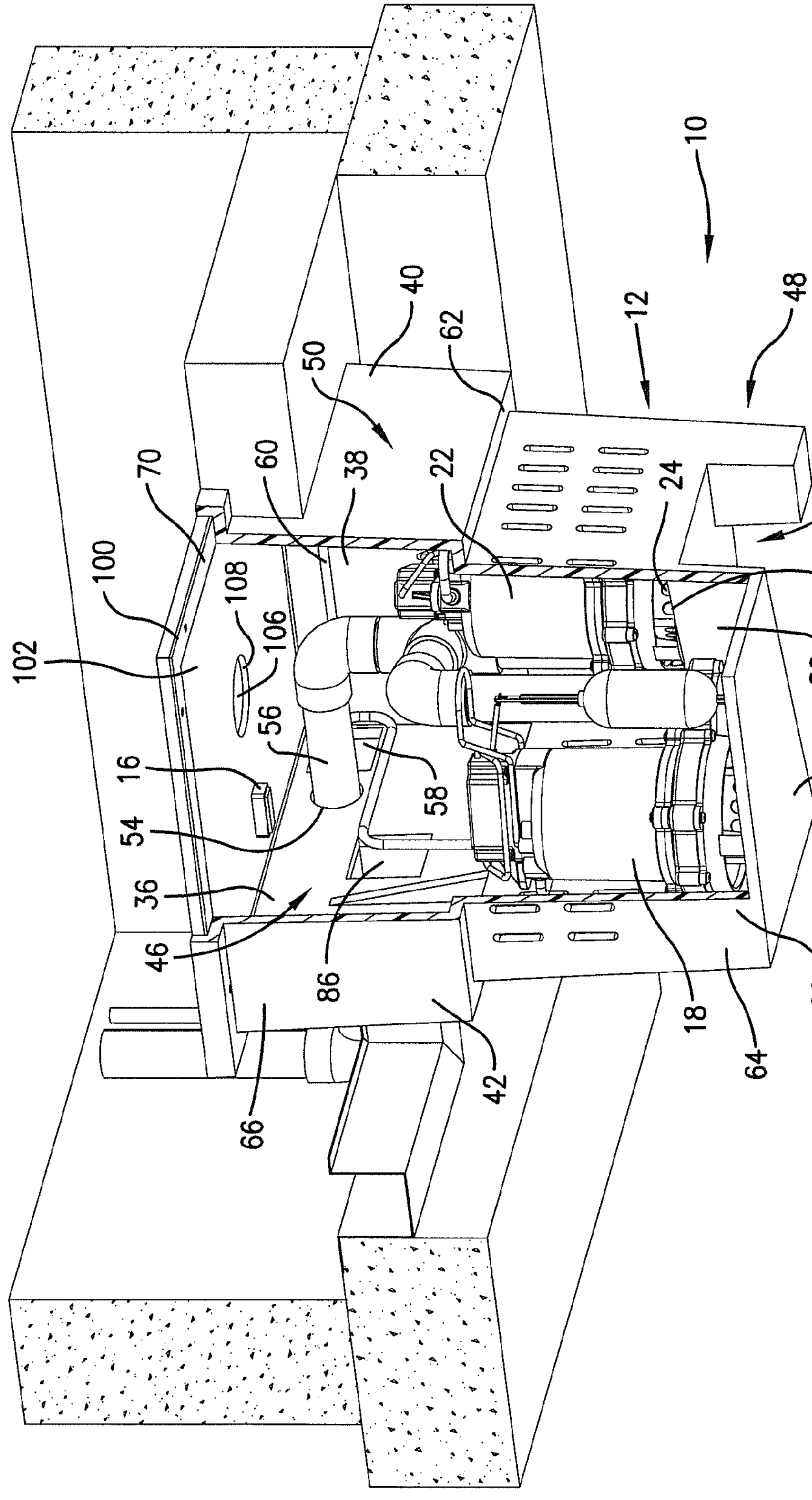
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Fig. 4.

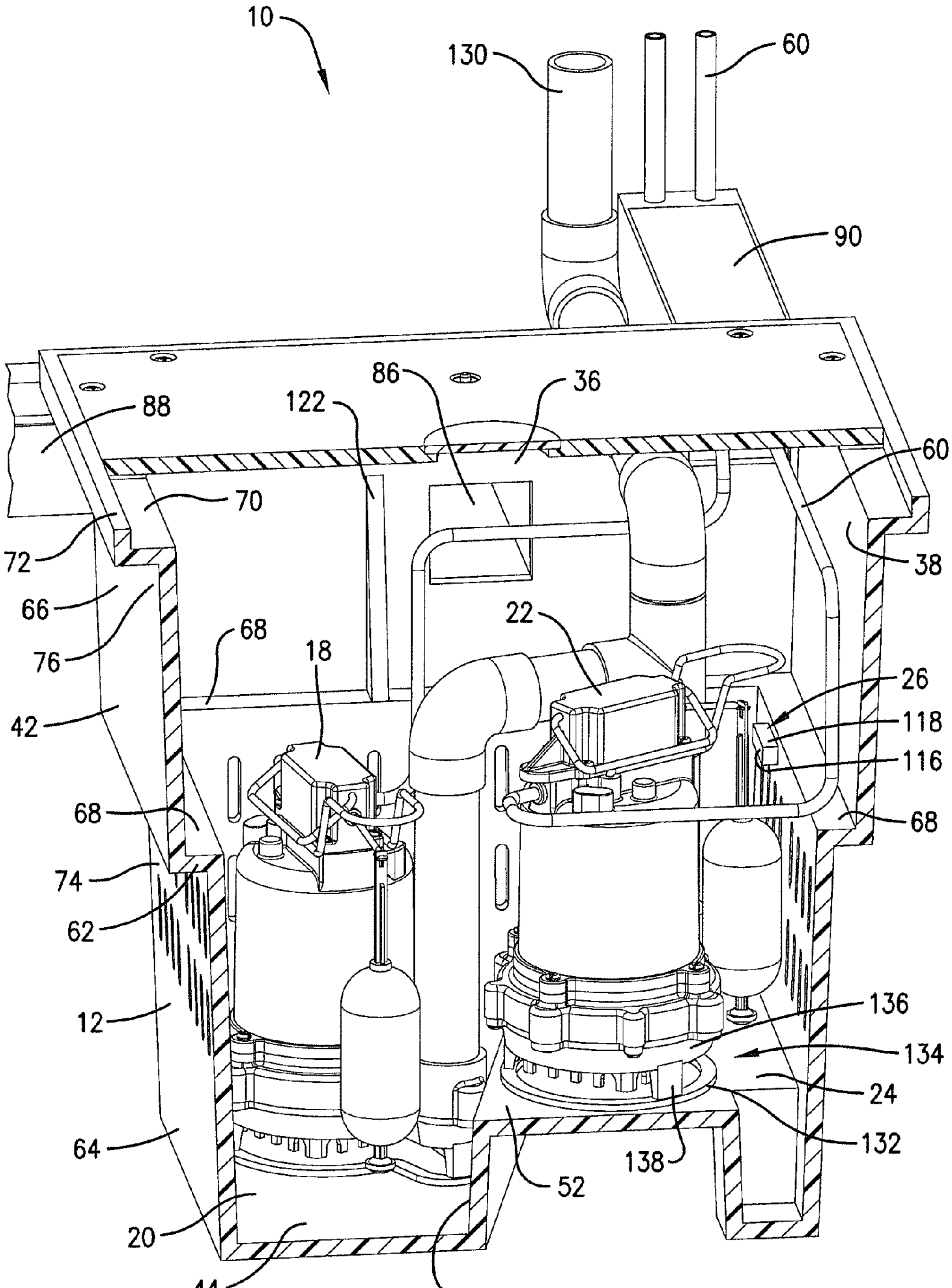

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Fig. 5.

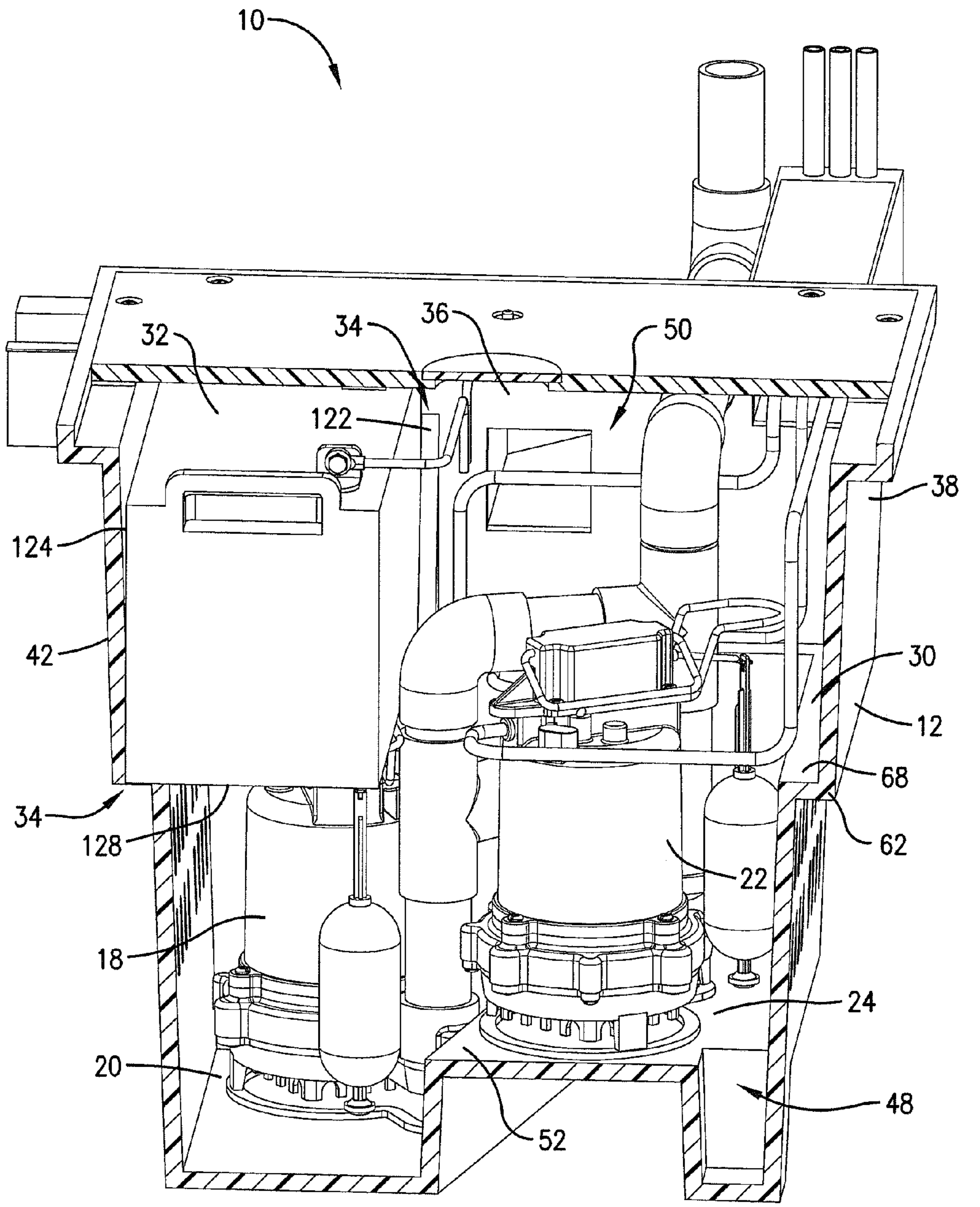

Fig. 6.

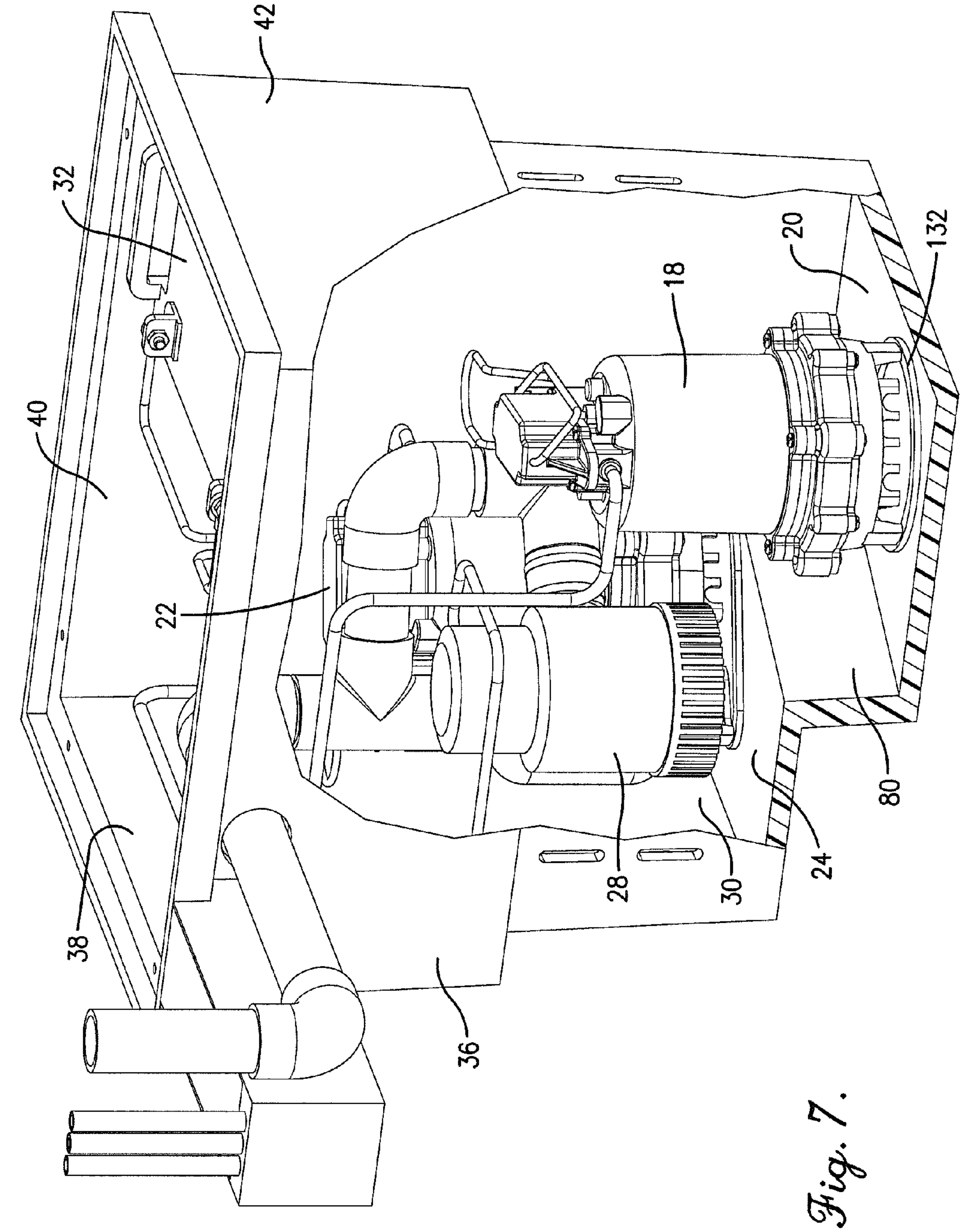

Fig. 7.

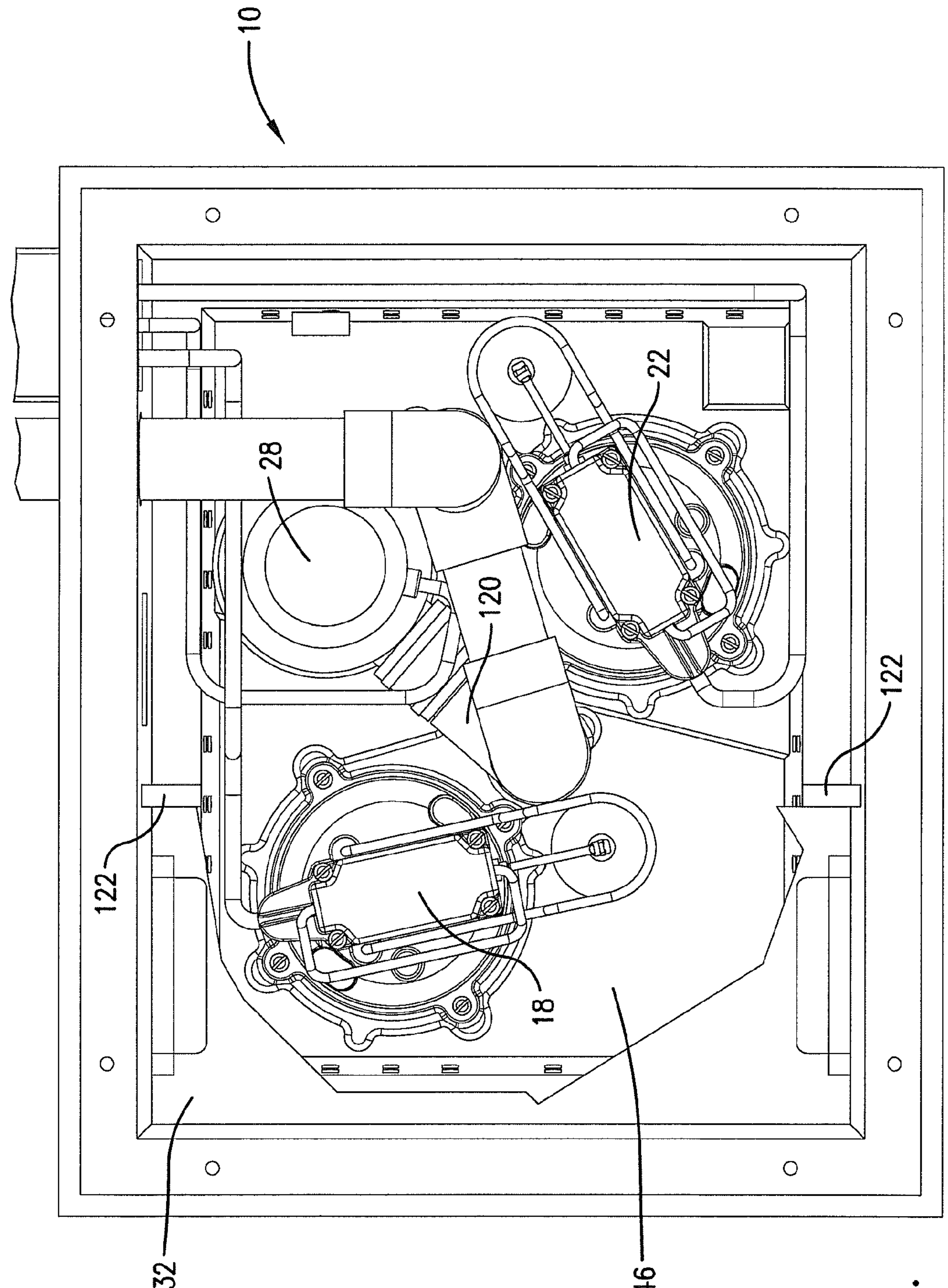

Fig. 8.

SUMP PUMP APPARATUS AND METHOD

RELATED APPLICATIONS

The present application is a non-provisional application and claims priority benefit, with regard to all common subject matter, of earlier-filed U.S. Patent Application entitled "SUMP PUMP APPARATUS AND METHOD", Ser. No. 12/987,756, filed Jan. 10, 2011, and issued on Nov. 4, 2014, as U.S. Pat. No. 8,875,729. The identified earlier non-provisional application is hereby incorporated by reference into the present application in its entirety.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present inventions relates to sump pump assemblies and methods for installing a sump pump that insure an entire use of the wear life of the installed pumps, that allow for viewing of a water level in the assembly's basin, that prevent movement of the pumps during use, and that allow for installation of the assembly in a finished basement.

2. Description of the Related Art

Sump pump assemblies and systems are commonly used to collect water from a lowermost elevation in a building, such as under and around the building's basement floor slab, and discharge the water to a location external to the building's foundation or to a sewer system. The sump pump assembly is traditionally buried in a sump pit that is built into the basement floor or building crawlspace. Water or other fluid and waste is collected within a sump pump basin. A submersible pump housed within the basin pumps the water to the discharge line **56** in fluid communication with the pump. The discharge line **56** then transports the water to the external location or sewer system.

Some sump pump assemblies include two or even three pumps. In a two-pump system, the second pump is installed for instances when the water volume flowing to the basin is so large that a first pump cannot pump and discharge the water sufficiently quickly. In other words, more water is entering the basin than is being pumped out of the basin, such that the basin overflows, which results in water damage to the building's foundation and basement floor.

In the two-pump system, the second pump is sometimes installed in the basin at an elevation that is higher than the first pump. This is because the pumps are activated based on the water level in the basin, either through a float activation or a pressure sensitive activation. The second pump will not activate until the water level rises high enough in the basin to activate a float or pressure sensitive sensor. Thus, in the two-pump system, the second pump is not activated until the water level rises due to the first pump not being able to keep up with the volume of water entering the basin.

The two-pump system as installed in the prior art has two significant disadvantages, however. First, the second pump is positioned at an elevation higher than the first pump by simply setting the second pump on one or more risers that are not fixed or secured within the basin. Although the pump itself is fairly heavy (it commonly has a cast iron body), the force and volume of the water in the basin still produces movement of the unsecured risers. If the movement of the risers then results in movement of the pump, this can adversely affect proper operation of the pump. In particular, the pump's float may become lodged against the basin wall, against the first pump, or against other components housed

within the basin, or the pressure sensor may be obstructed so that it does not properly function. The pump will then cease to activate as the water rises.

Accordingly, there is a need for a sump pump basin designed to elevate the second pump within the basin while still maintaining the second pump in a fixed location relative to the basin walls and other structure within the basin.

A second disadvantage of the prior art two-pump system occurs when the first pump ceases to operate due to common wear and tear or breaking of a part. The sump pump assemblies of the prior art are not easily accessible, and most building owners do not regularly check that the pumps are operating properly. The building owners then do not realize that the first pump has ceased operating until there is a large volume of water entering the basin that cannot be sufficiently discharged using only the second pump. As can be appreciated, the building owner's realization that the first pump ceased operating often comes too late to prevent water damage.

To address the breakdown of the first pump, some sump pump installers suggest replacing the first pump prior to its breakdown at end of life. Although this insures that the pump will (for the vast majority of circumstances) always operate, this also results in the first pump being replaced sometimes well before its end of life. For example, many sump pumps may have a 15-20 year lifespan. However, because of the significant damage that can occur if the first pump unknowingly ceases operating, some building owners will choose to replace the first pump after as little as 5-6 years of wear. This results in the vast majority of first pumps in a two-pump system not receiving almost 10-15 years of otherwise viable use.

Accordingly, there is a need for a sump pump assembly that allows for the building owner to obtain the entire wear life of the first pump without incurring the risk of the first pump unknowingly ceasing operating.

In a three-pump system, the third pump is commonly a battery-powered pump. In the two-pump system, both the pumps are AC powered by the building's electrical system. However, if the electricity is cut off, then the first and second pumps will not operate. Thus, some building owners choose to install the third pump that is DC battery powered for use in those instances where power to the first and second pumps is cut off. The battery is then positioned externally to the basin, often being located on the basement floor.

Accordingly, there is a need for a basin configured to house and mount the battery for a battery-powered pump.

As noted above, a disadvantage of prior art sump pump assemblies is that they are not easily accessible. The basin for the sump pump commonly includes a lid that is secured to the basin via a plurality of screws or bolts. To access an interior of the basin or otherwise see the water level in the basin, the building owner must unscrew the screws securing the lid. In instances where the building owner simply wants to view the water level in the basin, the removal of the lid is a time consuming task.

Accordingly, there is a need for a sump pump assembly, and in particular, a basin, that allows viewing of the water level in the basin without removal of the lid.

SUMMARY OF THE INVENTION

Embodiments of the present invention solve the above-mentioned problems and provide a distinct advance in the art of sump pump assemblies. More particularly, embodiments of the present invention provide a sump pump assembly that overcomes many disadvantages of prior art sump pump assemblies. The present sump pump assembly insures use of the entire wear life of the pumps without risking water damage to a basement due to a non-operating pump. The present sump pump assembly also houses all components of the assembly in a basin so as to present an aesthetically appealing assembly that can be installed in a finished basement. Further, the present sump pump assembly prevents the pumps from becoming dislodged or moving, which can adversely affect operation. Finally, the sump pump assembly provides a selectively illuminated basin interior for viewing of a water level of the basin without removal of a lid of the basin.

The sump pump assembly of embodiments of the present invention comprises a basin having first, second, third, and fourth walls and a floor so as to present an interior and a generally square or rectangular perimeter shape. The basin has a lower end contained by the floor and an open upper end and presents a lower elevation. The basin further includes a first generally horizontal interior shelf spaced above the basin floor, and particularly above the lower elevation, and fixedly positioned within the basin interior. The first shelf presents a midrange elevation in the basin, such that the midrange elevation is above the lower elevation.

The sump pump assembly further includes a lid removably secured to the open upper end of the basin. The lid has a transparent window for viewing a water level in the basin without removal of the lid from the upper end of the basin. Additionally, a selectively-powered light is mounted within the basin, and preferably within the lid, for illuminating the interior of the basin. An input for selectively actuating the light is provided external to the basin and preferably in the basin lid.

A first submersible pump is positioned at the lower elevation in the basin, and in some embodiments, the lower elevation is the floor of the basin. A second submersible pump is positioned on the first shelf at the midrange elevation of the basin. The second pump is associated with an activation elevation at which the second pump is activated due to the water level in the basin being at an elevation that activates the second pump, i.e., the activation elevation.

The sump pump assembly further includes an alarm having a sensor positioned within the basin and below the activation elevation of the second pump, such that the alarm is activated upon the water level in the basin rising to a level below the activation elevation for the second pump.

In an alternative embodiment of the present invention, the sump pump assembly further includes a second shelf presenting an upper elevation that is above the lower and midrange elevations, a third, battery-operated pump mounted at the upper elevation, a battery for powering the third pump, and a mount for mounting the battery. In embodiments of the present invention, the mount comprises the second shelf and at least one longitudinal rib extending inwardly within the basin.

The sump pump assembly of the present invention presents a sump pump that can be installed in a finished basement. Unlike prior art sump pumps where a discharge pipe extends from the lid of the basin and where the battery is external to the basin, embodiments of the present invention house all components within the basin. The building owner can then cover the basin lid with flooring or carpet so as to obtain a finished, aesthetically appealing basement area. When the building owner desires to view a water level in the basin, the internal light can be illuminated. Additionally, the present assembly allows for use of the entire life of the first and second pumps and maintains proper placement and positioning of the pumps during use.

This summary is provided to introduce a selection of concepts in a simplified form that are further described below in the detailed description. This summary is not intended to identify key features or essential features of the claimed subject matter, nor is it intended to be used to limit the scope of the claimed subject matter. Other aspects and advantages of the present invention will be apparent from the following detailed description of the embodiments and the accompanying drawing figures.

BRIEF DESCRIPTION OF THE DRAWING FIGURES

Embodiments of the present invention are described in detail below with reference to the attached drawing figures, wherein:

FIG. **1** is a perspective view of a sump pump assembly of embodiments of the present invention and particularly illustrating the assembly installed in a basement;

FIG. **2** is a rear perspective view of the sump pump assembly of FIG. **1** and particularly illustrating a bottom of a basin of the assembly;

FIG. **3** is a perspective view of the sump pump assembly of FIG. **1** with a portion of the sump pump basin removed to illustrate internal components of the assembly;

FIG. **4** is a upward facing perspective view of the assembly of FIG. **3**;

FIG. **5** is a perspective view of a first embodiment of the sump pump assembly of the present invention with a portion of the basin removed;

FIG. **6** is a perspective view of a second embodiment of the sump pump assembly of the present invention with a portion of the basin removed and illustrating a battery housed in the basin;

FIG. **7** is a fragmentary perspective view of the assembly of FIG. **6**; and

FIG. **8** is a fragmentary plan view of the assembly of FIG. **6**.

The drawing figures do not limit the present invention to the specific embodiments disclosed and described herein. The drawings are not necessarily to scale, emphasis instead being placed upon clearly illustrating the principles of the invention.

DETAILED DESCRIPTION

The following detailed description of the invention references the accompanying drawings that illustrate specific embodiments in which the invention can be practiced. The embodiments are intended to describe aspects of the invention in sufficient detail to enable those skilled in the art to practice the invention. Other embodiments can be utilized and changes can be made without departing from the scope of the present invention. The following detailed description is, therefore, not to be taken in a limiting sense. The scope of the present invention is defined only by the appended claims, along with the full scope of equivalents to which such claims are entitled.

In this description, references to "one embodiment," "an embodiment," or "embodiments" mean that the feature or features being referred to are included in at least one embodiment of the technology. Separate references to "one embodiment," "an embodiment," or "embodiments" in this description do not necessarily refer to the same embodiment and are also not mutually exclusive unless so stated and/or except as will be readily apparent to those skilled in the art from the description. For example, a feature, structure, act, etc. described in one embodiment may also be included in other embodiments, but is not necessarily included. Thus, the present technology can include a variety of combinations and/or integrations of the embodiments described herein.

Referring now to FIGS. **1-5**, in a first embodiment of the present invention, a sump pump assembly **10** and method broadly comprises a basin **12**, a lid **14** removably secured to the basin **12**, a light **16** mounted in the basin **12**, a first submersible pump **18** positioned at a lower elevation **20** in the basin **12**, a second submersible pump **22** positioned at a midrange elevation **24** in the basin **12**, and an alarm **26** positioned within the basin **12** such that the alarm **26** is activated upon the water level in the basin **12** rising to a particular elevation.

In a second embodiment of the present invention illustrated in FIGS. **1-2** and **6-8**, the sump pump assembly **10** and method broadly comprises the basin **12**, the lid **14** removably secured to the basin **12**, the light **16** mounted in the basin **12**, the first submersible pump **18** positioned at the lower elevation **20** in the basin **12**, the second submersible pump **22** positioned at the midrange elevation **24** in the basin **12**, a third, battery-powered submersible pump **28** positioned at an upper elevation **30** in the basin **12**, a battery **32** for powering the third pump **28**, a mount **34** for removably mounting the battery **32** in the basin **12**, and an alarm **26** positioned within the basin **12** such that the alarm **26** is activated upon the water level in the basin **12** rising to a particular elevation.

Referring to FIGS. **3-5**, the first embodiment of the present invention is illustrated. The basin **12** of embodiments of the present invention comprises first, second, third, and fourth walls **36**,**38**,**40**,**42** (hereinafter collectively referenced as "**36-42**") and a floor **44** so as to form an interior **46** of the basin **12** for housing various components of the sump pump assembly **10**. The basin **12** presents a lower end **48** contained by the floor **44** and an open upper end **50**. The walls **36-42** intersect to form a generally square or rectangular-shaped perimeter at the upper end **50** of the basin **12** or to otherwise form a basin **12** having a square or rectangular-shaped horizontal cross section. The basin **12** further includes a first generally horizontal interior shelf **52** spaced above the basin floor **44** and fixedly positioned within the basin interior **46**, a first opening **54** in one of the basin walls **36-42** for receipt of a discharge line **56** therethrough, and a second opening **58** in one of the basin walls **36-42** for receipt of wiring **60** therethrough.

The above description is provided to identify each of the walls **36-42** separately. However, it should be appreciated that the basin **12** may be made of a molded polymer, such that the walls **36-42** and floor **44** are integral. In particular, the basin **12** may be formed through injection molding or other suitable process that results in a generally unitary structure.

In embodiments of the present invention, the walls **36-42** intersect each other at an approximately 90° angle at the upper end **50** of the basin **12**. As illustrated in FIG. **3**, each wall **36-42** includes a first externally extending step **62** located generally intermediate a height of the wall **36-42** and dividing each wall **36-42** into lower and upper ends **64**,**66**. When the walls **36-42** are joined to form the basin **12**, the first externally extending step **62** forms a second generally horizontal interior shelf **68** for mounting the battery **32** of the second embodiment of the present invention, which is discussed in more detail below. The second shelf **68** presents the upper elevation **30**.

Each of the walls **36-42** also includes a second externally extending step **70** at the upper end **66** of the wall, such that when the walls **36-42** are joined to form the basin **12**, the basin **12** includes a lip **72**. (For ease of reference, each of the lower and upper ends **64**,**66** of the walls **36-42**, the first externally extending step **62**, and the second externally extending step **70** are identified by the same reference numeral).

Referring now to the lower end **64** of each wall **36-42**, a height of the lower end **64** is approximately 7-17 inches and more preferably approximately 12 inches. The lower end **64** of each wall **36-42** is angled gradually inwardly to create an approximate 2° draft from a top **74** of the lower end **64** of the wall **36-42** to the floor **44**. A width of the top **74** of each lower end **64** of the wall **36-42** is approximately 11-17 inches and more preferably approximately 14 inches.

Referring now to the upper end **66** of each wall **36-42**, a height of the upper end **66** is approximately 14-24 inches and more preferably approximately 19 inches. The upper end **66** of each wall **36-42** is angled gradually inwardly to create an approximate 2° draft from a top **76** of the upper end **66** of the wall **36-42** to the first externally extending step **62**.

The second and fourth walls **38**,**42** are slightly wider than the first and third walls **36**,**40**. A width of the first and third walls **36**,**40** at their upper end **66** (excluding the lip **72** formed from the externally extending step **70**) is approximately 14-21 inches and more preferably approximately 17.25 inches. A width of the second and fourth walls **38**,**42** at their upper end **66** (excluding the lip **72** formed from the externally extending step **70**) is approximately 18-24 inches and more preferably approximately 21 inches. A width of the externally extending step **70** is approximately 1-2 inches and more preferably approximately 1.25 inches.

It should be appreciated that the above measurements for the various dimensions of the basin **12** are for illustrative purposes only, and the dimensions for the basin **12** may be smaller or larger depending on a size of the components installed and/or whether the basin **12** is housing two or three pumps.

The basin floor **44** is substantially flat and presents the lower elevation **20** in the basin **12**. However, in embodiments of the present invention illustrated in the Figures, the basin floor **44** does not extend to cover an entire horizontal area formed by the lower end **64** of the basin walls **36-42**. In particular, the first generally horizontal interior shelf **52** is fixedly positioned in the lower end **48** of the basin interior **46**, as best illustrated in FIGS. **3** and **5**. In such an embodiment the first shelf **52** is integrally formed with the basin walls **36-42** and floor **44**. A horizontal area of the shelf **52** is approximately the same or less than a horizontal area of the floor **44**, although the first shelf's area can be smaller or larger to the extent the first pump **18** can be positioned on the floor **44** and the second pump **22** can be positioned on the first shelf **52**.

The first generally horizontal interior shelf **52** is spaced above the lower elevation **20** comprising the basin floor **44** preferably a vertical distance of approximately 1-6 inches, more preferably approximately 2-4 inches, and most preferably approximately 3.5 inches. As discussed in more detail below, the first shelf **52** is sized to receive the second pump **22**.

So as to form the first shelf **52** while not unduly wasting materials, the second, third, and fourth walls **38**,**40**,**42** are stepped to present external deadspace **78**. This is desirable so as to prevent an area underneath the first shelf **52** from receiving water thereunder, as it may be difficult for the first pump **18** to collect water from the area. As illustrated in FIG. **3**, a short retaining wall **80** extends downward from the first shelf **52** and to the floor **44**. This retaining wall **80** closes off the area under the first shelf **52** (i.e., the external deadspace **78**) so as to prevent water from flowing underneath the first shelf **52**.

In alternative embodiments of the present invention, the first shelf **52** is not integrally formed with the basin walls **36-42** and floor **44** but rather is coupled or otherwise attached to one or more of the basin walls **36-42** and/or basin floor **44**. For example, the first shelf **52** could be a separate component that is fixedly secured within the basin interior **46** via screws, bolts, or other fasteners (not shown). Thus, it is to be appreciated that the first shelf **52** being fixedly positioned within the basin interior **46** refers to the first shelf **52** being integrally formed with the basin floor **44** and walls **36-42** or to the first shelf **52** being fixedly coupled with the basin floor **44** and/or walls **36-42** so as to not be movable during use of the sump pump assembly **10**.

In even further alternative embodiments of the present invention, the walls **36-42** do not include the first externally extending step **62** to form the second generally horizontal interior shelf **68**. For example, the walls **36-42** could be substantially parallel, or, alternatively, the walls **36-42** could include an inwardly angled draft without the step **62**.

In embodiments of the present invention, the walls **36-42** may include markers (not shown) for indicating where the first and second openings **54,58** should be formed. In particular, up to three openings or holes may be formed in the basin **12**. The first opening **54** may be formed, preferably in the first wall **36**, for receipt of the discharge line **56** therethrough. The second opening **58** may be formed, preferably in the first wall **36** and proximate the first opening **54**, for receipt of wiring **60** therethrough.

In embodiments of the invention that are in fluid communication with a water diverting system **84** that diverts water to the sump pump assembly **10** from other areas around the building's foundation, a third opening **86** may be formed for fluid communication with an intake line **88** of the water diverting system **84**. In such an instance, the third opening **86** would be formed in the wall **36-42** closest to the intake line **88**. An exemplary water diverting system **84** is disclosed in U.S. patent application Ser. No. 12/980,601, filed Dec. 29, 2010, now U.S. Pat. No. 8,297,005, which is assigned to the assignee of the present application. The '601 Application is hereby incorporated by reference into the present application in its entirety.

Rather than forming the openings **54,58,86** during manufacture of the basin **12**, embodiments of the present invention include markers (not shown) for identifying preferred locations for the openings **54,58,86**. An installer of the sump pump assembly **10** can then manually form the openings **54,58,86** onsite. This insures that the openings **54,58,86** align properly with the various components, such as the discharge line **56**, a wire chase **90** for containing the wiring **60**, and the intake line **88** for the water diverting system **84**. The openings **54,58,86** will be sized to accommodate the components; however, a standard-sized opening is circular and approximately 2 inches in diameter, although differently shaped and sized openings **54,58,86** may be formed.

A plurality of perforations or slots **92** is formed in the lower end **48** of the basin **12**. The perforations **92** allow water to enter the basin **12**, where it is then collected by the pump(s). Referring to FIG. **1** and, each perforation **92** is approximately 2.25 inches in height and approximately ⅜ inch in width, although differently sized perforations **92** could be formed. The perforations **92** begin approximately 2 inches horizontally inward from an edge of each wall **36-42** to insure the structural integrity of the basin **12**. The perforations **92** are horizontally spaced approximately 0.5-0.75 inch. An approximate 2 inch center panel **94** is left with no perforations **92** to insure the structural integrity of the basin **12**. There are preferably at least two rows of perforations **92**, although there may be more or less depending on the desired flow rate of water into the basin **12**. There is an approximate 1 inch margin **96** between each row of perforations **92**. Preferably, the lowermost row begins at least 2-6 inches and more preferably approximately 4-4.5 inches above the basin floor **44** so as to act as a silt separator so that silt will not enter the basin **12**.

Referring now to FIGS. **1**, **3**, and **4**, the lid **14** is illustrated secured to the open upper end **50** of the basin **12**. The lid **14** preferably extends around the lip **72** of the basin **12** and is secured to the basin **12** by screws, bolts, or other fasteners **98** secured through the externally extending step **70**. A gasket **100** may be interposed between the lip **72** of the basin **12** and a bottom **102** of the lid **14** so as to assist in preventing dampness and radon from escaping through the lid **14**.

The lid **14** preferably includes a transparent window **104** for viewing a water level in the basin **12** without removal of the lid **14** from the upper end **50** of the basin **12**. The window **104** is formed of a transparent polycarbonate resin, such as Lexan®, or other suitable material and is generally circular with an approximate 4 inch diameter, although a differently-shaped and sized window **104** may be employed.

Referring to FIG. **4**, an opening **106** is formed in the lid **14** for receipt of the window **104**. The opening **106** includes a recessed lip **108** of approximately ¼ to ⅜ inch. The window **104** will sit on the lip **108** so as to be flush with a top **110** of the lid **14**.

The light **16** is mounted so as to illuminate the interior **46** of the basin **12**. In preferred embodiments of the present invention, the light **16** is mounted within the basin **12**, and in even further preferred embodiments of the present invention, the light **16** is mounted on or otherwise countersunk in the bottom **102** of the lid **14**. The light **16** is coupled with an input **112** that is external to the basin **12** for actuation by a building owner. Preferably, the input **112** is push button with a flexible top and is flush with the top **110** of the lid **14**. The light **16** is preferably battery operated and comprises at least one LED that is sufficiently bright that the building owner can determine the water level of the basin **12** upon actuation of the input **112** and powering of the light **16**. The light **16** is positioned approximately 2-5 inches and more preferably approximately 3 inches from the window **104**.

As noted above, the first embodiment of the sump pump assembly **10** employs two pumps **18,22**, while the second embodiment employs three pumps **18,22,28**. The pumps **18,22,28** used in the sump pump assembly **10** of the present invention are conventional float-activated or pressure-activated submersible AC sump pumps. As is known in the art, the pumps **18,22,28** are operable to collect the water and discharge it to the discharge line **56**. The first and second pumps **18,22** are powered by the building's electrical system and therefore, access an external outlet in the building (not shown). The wiring **60** for the first and second pumps **18,22** extends through the second opening **58**, discussed above, and to the wire chase **90**. As discussed below, the wire chase **90** is preferably mounted within a basement floor slab **114** so as to be generally flush with the floor. In embodiments of the present invention, two dedicated electrical outlets are installed for each of the first and second pumps **18,22**.

In both embodiments, the first pump **18** is positioned at the lower elevation **20**, which preferably comprises the basin floor **44** and as best illustrated in FIG. **3**. However, it is contemplated that the lower elevation **20** may be higher than the basin floor **44**, such as if a third shelf (not shown) was installed or formed in the basin **12** to receive thereon the first pump **18** at the lower elevation **20**. In such a case, the third shelf would comprise the lower elevation **20**. The present invention contemplates, however, that the lower elevation **20** is vertically below the height of the first shelf **52**.

The second pump **22** is positioned on the first shelf **52**, which is at the midrange elevation **24** in the basin **12**. As noted above, the first shelf **52** comprising the midrange elevation **24** is above the lower elevation **20** comprising the fixture (i.e., the floor **44** or the third shelf) on which the first pump **18** is positioned, such that the midrange elevation **24** is above the lower elevation **20**. It is to be understood that use of the term "midrange elevation" refers to an elevation between the lower elevation **20** and the upper elevation **30** and does not necessarily indicate an elevation that is in the middle of a height of the basin **12**.

The second pump **22** is further associated with an activation elevation. The activation elevation is the vertical height to which the water level in the basin **12** must rise to activate the second pump **22**. As can be appreciated, the activation elevation may vary depending on the make or model of the second pump **22**, including whether the second pump **22** is a float-activated or pressure-activated pump. However, regardless of the type of second pump **22** employed, the second pump **22**, once positioned on the first shelf **52** of the basin **12**, will activate once the water level reaches a certain height, which is referred to herein as the activation elevation for the second pump **22**.

The final primary component of the first embodiment of the sump pump assembly **10** of the present invention is the alarm **26**. The alarm **26** includes a sensor **116** that detects the water level in the basin **12**, such as a pressure-sensitive sensor or a sensor to sense the mechanical activation of the second pump's float (assuming the second pump **22** is float-activated). The sensor **116** may be housed within a housing **118** of the alarm **26** or may be operably coupled with the housing **118** of the alarm **26**. The sensor **116** is positioned within the basin **12** and below the activation elevation of the second pump **22**, such that the alarm **26** is activated upon the water level in the basin **12** rising to a level below the activation elevation for the second pump **22**. More particularly, the alarm **26** activates when the water level rises above an activation level for the first pump **18** and below the activation level for the second pump **22**. In embodiments of the present invention, the sensor **116** is positioned approximately 0.25-5 inches above the activation elevation for the first pump **18**, more preferably within 3 inches above the activation elevation for the first pump **18**, and most preferably within 0.75 inch above the activation elevation for the first pump **18**. Thus, the alarm **26** will activate very shortly after the water level rises above the activation elevation for the first pump **18**.

Referring to FIGS. **6-8**, the second embodiment of the present invention is illustrated. The second embodiment is substantially similar to the first embodiment, except that the second embodiment employs the third, battery-operated pump **28** and associated battery **32**. Unlike the prior art, however, the battery **32** for the third pump **28** is mounted and otherwise housed within the basin **12**. In referring to the second embodiment of the present invention, the same reference numerals for like features are used.

The third pump **28** is positioned in the upper end **50** of the basin **12** and rests on the second generally horizontal interior shelf **68**. Because the battery-operated third pump **28** weighs significantly less than the first and second pumps **18**,**22** that have a cast iron housing, the second shelf **68** is sufficient to stabilize the third pump **28**. The second pump **22** also includes a fluid line **120** in communication with the discharge line **56**, and this fluid line **120** further assists in stabilizing and holding the third pump **28** in the basin **12**.

The battery **32** for the pump **28** is mounted within the basin **12** using the mount **34**. In the embodiment of the present invention illustrated in the Figures, the mount **34** comprises a portion of the second shelf **68** and at least one internally extending longitudinal rib **122**. The battery **32** is approximately 16 inches in length, 9 inches in height, and 7 inches in depth. Referring to FIG. **6**, the basin **12** is preferably sized and the rib **122** is preferably located so that a rear side **124** of the battery **32** is adjacent the fourth wall **42** of the basin **12**. The rib **122** extends inwardly from the third wall **40**, and, in some embodiments, a second rib (not shown) extends inwardly from the first wall **36**. The rear side **124** of the battery **32** rests on the second shelf **68** formed by the steps **62** of the first, third, and fourth walls **36**,**40**,**42**. The rib **122** assists in preventing the battery **32** from toppling forward. Thus, the mount **34** of the present invention, in combination with the square or rectangular shaped basin **12**, allows the battery **32** to be securely and removably mounted in the basin **12**. It should be appreciated that the battery **32** could be mounted against another wall, such as the second wall **38**.

Referring now to FIGS. **1**, **3**, and **7**, installation of the sump pump assembly **10** will now be described. The installer of the assembly first excavates a sump pit **126** in the basement floor **114** or crawlspace of the building. As set forth above, the basin **12** has a total height of approximately 30-35 inches. The basement floor slab **114** is usually only approximately 4 inches. Therefore, the installer will need to excavate the pit **126** into the soil, gravel, and other earth underneath the basement floor **114**. After the pit **126** is excavated, the basin **12** is positioned within the pit **126**, and the pit **126** is backfilled with gravel up to approximately 4-6 inches from the top of the basin **12**.

The installer next positions the first pump **18**. As noted above, the first pump **18** is positioned at the lower elevation **20**, which will usually be the floor **44** of the basin **12** but may be a third shelf positioned proximate to the basin floor **44**. Due to the first shelf **52** fixedly secured in the basin **12**, the first pump **18** is securely positioned on the basin floor **44**, such that it is not encumbered by other components of the assembly **10**. The installer then positions the second pump **22** on the first shelf **52**. Again, due to the size and location of the first shelf **52**, the second pump **22** is securely positioned within the basin **12** and will not be subject to being dislodged or moved so that it is encumbered by other components in the basin **12** or the basin walls **36-42**.

In alternative embodiments of the present invention, the first and second pumps **18**,**22** can be further secured into position within the basin **12** and prevented from moving or becoming dislodged via installation of a non-skid, shock absorbing buffer **132** located on a bottom **134** of the pumps **18**,**22**. Referring to FIGS. **5-6**, the conventional pumps **18**,**22** include a base **136** having feet **138** thereon, and it is the feet **138** that contact the basin floor **44** or first shelf **52**. As noted above, once water enters the basin **12**, the pumps **18**,**22** are subject to moving and becoming dislodged. Although the basin shape of the present invention assists in preventing movement of the pumps **18**,**22**, the buffer **132** further assists in preventing even very small (i.e., less than 0.5-1 inch) displacement of the pumps **18**,**22**. The buffer **132** also further assists in absorbing the shock and vibration of the pumps **18**,**22** due to the pump motors.

The buffer **132** of the present invention is preferably a line of rubber or other non-skid, shock absorbing material. The buffer's vertical cross sectional shape may be generally circular, oblong, rectangular, or any other shape. The buffer **132** is preferably approximately ⅛-3/16 inch thick and approximately 10-25 inches long, as needed. The buffer **132** is preferably slightly rigid so that it can be laid out in the shape of the pump bottom **134**. In an even further preferable form, the buffer **132** is manufactured to mimic the shape of the bottom **134** of the respective pump **18**,**22** and maintain that shape for placement in the basin **12**. The buffer **132** is then secured to the basin **12** using adhesive and/or a nylon fastener, such as a plastic anchor, screw, bolt, or rivet (not shown). Due to the weight of the respective pump **18**,**22**, the feet **138** of the pump **18**,**22** will press into the rubber buffer **132** so as to further assist in preventing movement of the pump **18**,**22**.

The buffer **132** may alternatively be a series of rubber pieces (not shown) positioned where the feet **138** will stand relative to the basin **12**. Thus, the buffer **132** need not be a unitary line. In such an instance, each rubber piece would be secured to the basin **12**. However, the buffer **132** formed in the shape of the pump bottom **134** assists in installing the pump **18**,**22**, as the installer can position the buffer **132** in the basin **12** first and know that the respective pump **18**,**22** will be located directly on top of the buffer **132**. Due to the sizing of the basin **12** of the present invention, the pumps **18**,**22** can usually only be positioned in the basin **12** in one orientation. Use of the buffer **132** allows the installer to see the orientation and footprint of the pump prior to installation of the pumps.

After installing the buffer and the pumps, the discharge line **56** is installed. The discharge line **56** comprises a conventional PVC pipe or other suitable conduit. Unlike the prior art where two discharge lines are used for the respective first and second pumps **18**,**22**, the present invention employs a single discharge line for both pumps **18**,**22**.

If the second embodiment of the present invention is being installed, the installer will also install the third pump **28** and the battery **32**. The battery **32** is mounted within the basin **12** using the mount **34**, which comprises a portion of the second shelf **68** and the longitudinal rib **122**. The basin **12** is sized to receive the battery **32** between opposing walls. In particular, the battery **32** is sized to fit laterally between the first and third walls **36**,**40**, as best illustrated in FIGS. **6** and **7**. The rear side **124** of the battery **32** would then be adjacent to and in contact with the fourth wall **42**. A bottom edge **128** of the left and right sides and rear side **124** of the battery **32** rests on the second shelf **68**. The longitudinal rib **122** is spaced so that it catches a front side of the battery **32** should the battery **32** begin to topple forward.

As noted above, the installer will form the first and second openings **54**,**58** in the basin **12** using the markers as guidance. The discharge line **56** will extend through the first opening **54** and connect with an external conduit **130** that carries the water to a location external to the building. Similarly, the wiring **60** for the first and second pumps **18**,**22** will connect with the external wire chase **90**. The wire chase **90** is a metal or plastic housing for the wiring **60** that includes a cover for accessing the wiring **60**. When installed, the external conduit **130** in fluid communication with the discharge line **56** will be below the basement floor slab **114**. In contrast, the wire chase **90** is positioned next to and above the conduit **130**, such that the slab **114** will be poured or otherwise excavated to house the wire chase **90**. The chase **90** will then be generally flush with the top of the floor slab **114**.

If the sump pump assembly **10** is connected with the water diverting system **84**, the installer will also form the third opening **86** in the upper end **50** of the basin **12** for connecting with the system **84**, as illustrated in FIGS. **2** and **3**.

Thus, once all components are installed, the battery **32** is located directly above the first pump **18**. The second pump **22** is generally across from the first pump **18** and vertically higher than the first pump **18**, and the third pump **28** is positioned above the first and second pumps **18**,**22**, such that the pumps **18**,**22**,**28** are arranged in a generally triangular shape within the basin **12**.

In operation, the basin **12** will fill with water, and the first pump **18** will operate to discharge the water from the basin **12**. Should the first pump **18** cease operating, the water level will rise above the first pump's activation elevation and set off the alarm **26**, which is positioned immediately above the first pump's activation elevation and, in all instances, below the second pump's activation elevation.

Although the invention has been described with reference to the embodiments illustrated in the attached drawing figures, it is noted that equivalents may be employed and substitutions made herein without departing from the scope of the invention as recited in the claims. For example, the first and second pumps **18**,**22** could have different horsepowers, such as ⅓ HP and ½ HP, and separate discharge lines for handling a larger volume of water.

Having thus described various embodiments of the invention, what is claimed as new and desired to be protected by Letters Patent includes the following:

1. A sump pump assembly comprising:
- a basin presenting an interior,
- said basin having a lower end and an upper end,
- said basin including a first, lower elevation,
- said basin further including a generally horizontal interior second, upper elevation, wherein the second, upper elevation is above the first, lower elevation;
- a lid covering at least a portion of the upper end of the basin, said lid having a transparent portion,
- wherein the transparent portion of the lid is sized for viewing, by a user, a water level in the basin;
- a selectively-powered light mounted within the basin for illuminating the interior of the basin,
- wherein a combination of the transparent portion in the lid and the light mounted within the basin allows the user to view the water level in the basin through the transparent portion and without removing the lid of the basin;
- a first submersible pump for positioning at the first, lower elevation in the basin;
- a second submersible pump for positioning at the second, upper elevation, said second pump having an activation elevation at which the second pump is activated due to the water level in the basin being at approximately the activation elevation;
- a battery for powering at least one of the first and second pumps; and
- a battery mount positioned within the interior of the basin for mounting said battery.

2. The sump pump assembly of claim **1**, further including a third pump for installation in the basin.

3. The sump pump assembly of claim **2**, wherein said third pump is powered by the battery.

4. The sump pump assembly of claim **1**, further including an alarm having a sensor configured to sense the water level at a level below the activation elevation of the second pump, such that the alarm is activated upon the water level in the basin rising to a level below the activation elevation for the second pump.

5. The sump pump assembly of claim 1, said light including an input external to the basin for powering the light by the user and without removing the lid.

6. The sump pump assembly of claim 1, wherein the second upper elevation is presented by a shelf is fixedly positioned with the interior of the basin.

7. The sump pump assembly of claim 6, wherein the basin is unitarily molded with the shelf.

8. The sump pump assembly of claim 1, further including a first and a second rubber buffer each presenting a general shape of a respective footprint of the first and second pumps,

said buffers being configured for securement to the basin and for receipt of a bottom of the respective pump thereon,

said buffers assisting in preventing movement of the respective pump.

9. The sump pump assembly of claim 1, further including a single discharge line, wherein the single discharge line is fluidly connected to said first and said second submersible pumps.

10. A sump pump assembly comprising:

a basin presenting an interior,

said basin having a lower end and an upper end,

said basin interior presenting a first, lower elevation configured for having a first submersible pump positioned thereon;

said basin interior presenting a generally horizontal second, upper elevation, wherein the second, upper elevation is spaced above the basin floor, such that the second, upper elevation is above the first, lower elevation,

said second, upper elevation configured for having a second submersible pump positioned thereon;

a lid covering at least a portion of the upper end of the basin; and

a battery mount positioned within the interior of the basin for mounting a removable battery for powering at least one pump mounted within the basin.

11. The sump pump assembly of claim 10, wherein the lid includes a transparent portion formed in the lid and sized for viewing, by a user, a water level in the basin.

12. The sump pump assembly of claim 11, further including a light having an input external to the basin for powering the light by the user and without removing the lid,

wherein a combination of the transparent portion in the lid and the light mounted within the basin allows the user to view the water level in the basin through the transparent portion and without removing the lid of the basin.

13. The sump pump assembly of claim 10, further including an alarm having a sensor configured to sense the water level at a level below the activation elevation of the second pump, such that the alarm is activated upon the water level in the basin rising to a level below the activation elevation for the second pump.

14. The sump pump assembly of claim 10, wherein the second upper elevation is presented by a shelf, and the basin is unitarily molded with the shelf.

15. The sump pump assembly of claim 10, further including a first and a second rubber buffer each presenting a general shape of a respective footprint of the first and second pumps,

said buffers being configured for securement to the basin and for receipt of a bottom of the respective pump thereon,

said buffers assisting in preventing movement of the respective pump.

16. The sump pump assembly of claim 10, further including a single discharge line configured for fluidly connecting to said first and said second submersible pumps.

17. A sump pump assembly comprising:

a basin presenting an interior,

said basin having a lower end and an upper end,

said basin presenting a first, lower elevation configured for having a first submersible pump positioned thereon,

said basin further including a first generally horizontal interior shelf positioned within the basin interior at a second elevation that is above the first, lower elevation,

said first shelf configured for having a second submersible pump positioned thereon,

said basin further including a second generally horizontal interior shelf positioned within the basin interior at a third elevation that is above the first, lower elevation,

said second shelf configured for having a third pump positioned thereon;

a battery mount positioned within the interior of the basin for mounting a removable battery for powering the third pump;

a lid covering at least a portion of the upper end of the basin, said lid having a transparent portion,

wherein the transparent portion of the lid is sized for viewing, by a user, a water level in the basin; and

a selectively-powered light mounted within the basin for illuminating the interior of the basin,

wherein a combination of the transparent portion in the lid and the light mounted within the basin allows the user to view the water level in the basin through the transparent portion and without removing the lid of the basin.

18. The sump pump assembly of claim 17, wherein the first and second shelves are fixedly positioned with the interior of the basin.

19. The sump pump assembly of claim 17, wherein the basin is unitarily molded with the first and second shelves.

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